

What is Claimed is:

1. An electric power steering apparatus for performing steering assist by transmitting a driving force produced by an electric motor to a steering mechanism, comprising:

an operation amount sensor for sensing an operation amount of an operation member for steering a motor vehicle; and

a reference assist characteristics setting section for setting reference assist characteristics which are reference characteristics of a motor driving target value corresponding to the operation amount sensed by the operation amount sensor;

a motor driving target value setting section for setting a motor driving target value corresponding to the operation amount sensed by the operation amount sensor in accordance with corrected assist characteristics obtained by shifting the reference assist characteristics set by the reference assist characteristics setting section along an axis of coordinates of the operation amount;

a shifting amount setting section for setting, when forward stroke steering for

operating the operation member in a direction away from a steering angle midpoint is done, a shifting amount of the corrected assist characteristics with respect to the reference assist characteristics to zero, while setting, when return stroke steering for operating the operation member toward the steering angle midpoint is done, the shifting amount of the corrected assist characteristics with respect to the reference assist characteristics to a value at which corrected assist characteristics is obtained in which an absolute value of the motor driving target value corresponding to the operation amount sensed by the operation amount sensor is increased; and

15 a motor driving section for driving the electric motor on the basis of the motor driving target value set by the motor driving target value setting section.

2. The electric power steering apparatus

20 according to claim 1, further comprising

a steering speed sensor for sensing a steering speed by the operation member,

the shifting amount setting section variably setting a shifting direction and the shifting

25 amount of the reference assist characteristics

depending on a direction and a magnitude of the steering speed sensed by the steering speed sensor.

3. The electric power steering apparatus
5 according to claim 2, wherein

the operation amount sensor is a steering torque sensor for sensing a steering torque applied to the operation member,

the steering torque sensed by the steering
10 torque sensor takes a positive value with respect to a first steering direction which is either one of rightward and leftward directions, while taking a negative value with respect to a second steering direction which is the other direction,

15 a positive value of the motor driving target value is assigned to the steering torque value taking a positive value, while a negative value of the motor driving target value is assigned to the steering torque value taking a negative value
20 in the reference assist characteristics,

the steering speed sensed by the steering speed sensor takes a positive value with respect to the first steering direction, while taking a negative value with respect to the second steering
25 direction,

the shifting amount setting section

setting, in a case where the steering torque sensed by the steering torque sensor is not less than zero, the shifting amount to zero when the steering speed sensed by the steering speed sensor takes a positive value of not less than a first predetermined value, while setting the shifting amount depending on the steering speed when the steering speed takes a value of less than the first predetermined value, and

setting, in a case where the steering torque sensed by the steering torque sensor takes a negative value, the shifting amount to zero when the steering speed sensed by the steering speed sensor takes a negative value of not more than a second predetermined value, while setting the shifting amount depending on the steering speed when the steering speed takes a value exceeding the second predetermined value.

4. The electric power steering apparatus according to claim 1, further comprising

a vehicle speed sensor for sensing a vehicle speed of the motor vehicle equipped with the electric power steering apparatus,

the shifting amount setting section including

a vehicle speed adaptive shifting amount setting section for variably setting the shifting amount of the corrected assist characteristics with respect to the reference assist characteristics depending on the vehicle speed sensed by the vehicle speed sensor.

5. The electric power steering apparatus according to claim 1, further comprising a steering torque sensor for sensing the steering torque applied to the operation member, the shifting amount setting section including a steering torque adaptive shifting amount setting section for variably setting the shifting amount of the corrected assist characteristics with respect to the reference assist characteristics depending on the steering torque sensed by the steering torque sensor.